

FOLIO

THE UNIVERSITY OF ALBERTA STAFF BULLETIN

EDMONTON, ALBERTA

JANUARY 15, 1976

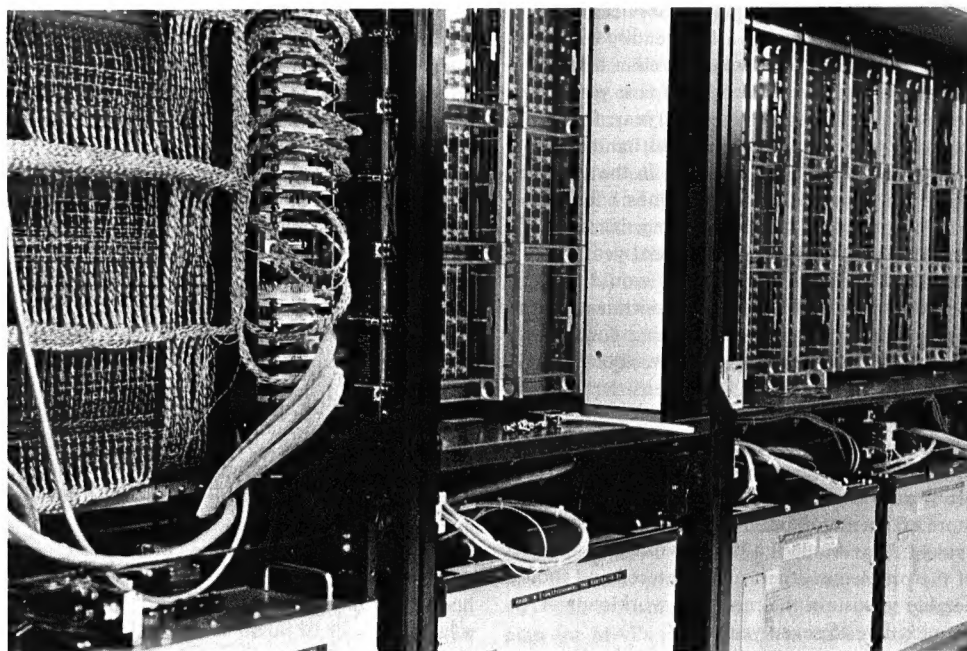
THE AMDAHL 470V/6

In October of 1974, the IBM 360/67 at Computing Services reached its capacity. The demand for computer resources had reached a point where the 360/67 could not handle the workload. Backlogs built up, job completion times increased, terminal response was lengthy, and many teaching and research projects were postponed or turned down.

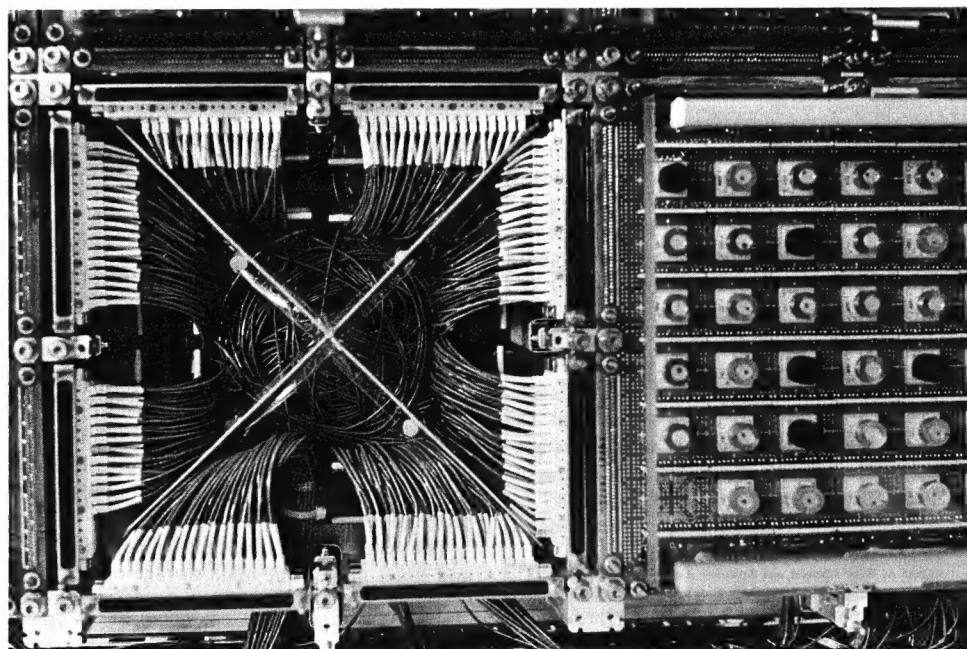
Now, a little over a year later, Computing Services has installed, and is in the process of testing, a replacement for the IBM 360/67. This replacement is an Amdahl 470V/6, a relatively new type of high performance, general purpose computer which runs approximately eight times faster than the IBM 360/67. In addition, it should prove more reliable because of certain revolutionary design components such as large-scale integration circuitry and built-in error detection and correction logic.

The Amdahl 470V/6 was chosen after months of discussion and study by the Computing Services Department, the Computer Facilities and Policy Committee, the Provincial Department of Advanced Education and Manpower, Central Administration, and the Amdahl Corporation. In the judgment of the University, based on information available, the Amdahl 470V/6 is preferable to a comparable computer manufactured by IBM, the IBM 370/168-3. From comparison data collected by Computing Services and available from other centres that have installed Amdahl 470V/6 computers, it is about forty percent faster and more reliable than the IBM 370/168-3. The Amdahl being installed here is the fifth one in operation in North America; others are located at the University of Michigan, the Computer Usage Corporation, Texas A and M University, and the Institute for Space Studies at Columbia University.

The need for a new computer at Computing Services was obvious. Over the years, more and more teaching and research conducted at the University has made use of the speed, accuracy, and reliability of computer systems. One thinks immediately of teaching and research projects in the pure and applied sciences, but there are uses for computers in teaching and research undertaken in the social sciences, in medicine, in business, and in the humanities. The Faculty of Science is still the largest user of Computing Services



Richard Kerr



Richard Kerr

Shown above from left to right is the main storage unit, the high speed buffer, and the central processing unit of the Amdahl 470V/6 computer at Computing Services. Below is a multi-chip carrier (MCC), the main component

of the Amdahl's "large-scale integration" technology, showing the forty-two silicon chips with their cooling studs and fins (right), and some of the complex circuitry to which the MCC circuit board is connected (left).

facilities, but a number of other faculties, schools, and departments are making increased use of computer resources: Agriculture and Forestry, Business Administration and Commerce, Education, and Medicine (mainly in the fields of biochemistry and immunology) all are increasing their use of and need for computing facilities.

The workload at Computing Services, therefore, has been increasing steadily over the years, and projected estimates predict that demand will increase in the next five years. A decade ago in the 1965-66 fiscal year, for example, the total number of jobs handled by Computing Services was 37,622; in the 1974-75 fiscal year, the total number of jobs handled was 574,561; that figure itself is an increase of 21,645 jobs over the previous fiscal year.

Even in faculties in which one would think there is little use for computer assistance, there is more teaching and research being done with the help of computers. Right now, about ninety departments and schools, as well as the libraries and administrative offices, use the resources of Computing Services. The number of jobs and the workload is growing and will continue to grow, and with this growth, the need for faster, more efficient computing systems becomes evident. The Amdahl 470V/6 will solve many of the problems hitherto encountered and should be able to sustain the projected workloads of the next five to seven years.

There are five major components in the Amdahl 470V/6 system: the main storage, the central processing unit, the I/O channels, the console, and the power distribution unit. Motor generator sets have been installed in the

basement of the General Services Building to generate the special power that the power distribution unit supplies to the 470V/6.

The system console is the interface between the computer and the operator. It is here that the operator enters instructions and responses to requests from the computer (for example, a request to mount a specific magnetic tape containing information the computer requires to execute a program); and it is here that the operator receives messages and status information (for example, how many programs are running and at what stages they are at) from the computer. The console is composed of a keyboard for entering responses and instructions, a CRT (cathode ray tube) display unit which is like a TV screen upon which the messages and requests from the computer are printed, and a minicomputer which can be used in a "diagnostic mode" to check out the logical circuitry of the computer proper for malfunctions.

The I/O (input-output) channels are the pathways from the I/O devices (such as card readers, terminals, magnetic tape storage units, etc.) to the central processing unit which carry information back and forth between the device and the computer. These channels, which in fact are complex circuits, are "interleaved" (that is, can have a number of I/O devices hooked up in various combinations) to provide a large number of possible data pathways. The Amdahl 470V/6 has sixteen channels with a total capacity of 1,024 possible data paths. The interleaving of the channels creates a "multiplexor" function (allows for a number of different signals to be transmitted concurrently on one channel) which increases the overall productivity of the whole system since the central processing unit is designed to handle a number of tasks at once.

The central processing unit (CPU) is the part of the system which performs interpretation and execution of instructions contained in user programs. The CPU directs the working of the I/O channels, fetches and stores instructions and data, interprets instructions and messages, and performs the various logical and arithmetical operations which are part of the computer program. Generally, the CPU oversees the operation of the whole system under the control of a special program called the "supervisor".

The central processing unit fetches data from and stores data in the main storage or "memory." The main storage also contains various instructions for different kinds of tasks such as adding, sorting, storing, and so on. The main storage is distinguished from auxiliary storage units such as magnetic tapes or magnetic discs. The 470 allows for up to eight megabytes of readily accessible data in the main storage. (A "byte" is eight "bits"; bit is an

acronym for *binary digit* and signifies one piece of information.) The capacity of the main storage is twice the storage capacity of the IBM 360/67. The sixty-four million bits which can be contained in the 470's main storage can be augmented by peripheral storage devices already mentioned; all the peripheral equipment such as magnetic tape or disc storage which was in use with the IBM 360/67 is compatible with the Amdahl computer.

Between the CPU and the main storage is a "high speed buffer"; the buffer is somewhat analogous to a waiting room. The access speed of the main storage (the speed with which data is stored and fetched, a speed dependent upon the nature of the circuitry) is slower than the operating speed of the central processing unit. If the CPU had to wait for the slower main storage to return data and execution instructions, the computer would not be operating efficiently. The high speed buffer overcomes this problem of speed differences. Since most tasks to be performed by the CPU are composed of a series of sequential operations, the whole series can be fetched from the main storage at one time. The instructions are moved into the high speed buffer where they then wait for the CPU to receive them. The instructions can be fetched from the buffer by the CPU at the normal execution speed, thus speeding up the execution of the task. The circuitry of the CPU is overlapped and interleaved so that six different instructions can be executing simultaneously. The time required for the central processing unit to complete most instructions is in the range of thirty to three hundred nanoseconds, with some parts of the process being performed at speeds in the range of six hundred picoseconds. Nanoseconds are billionths of a second and picoseconds are trillionths of a second, 10^{-9} and 10^{-12} seconds respectively. To get some idea of this kind of speed, one can try to imagine this: light will travel only about one foot in one nanosecond.

In order to reduce operating speed so dramatically, Amdahl uses what is called large-scale integration (LSI) semi-conductor technology. This means that the density of the circuits is increased; large-scale integration reduces the number of circuits and the length of interconnections between them; this results in faster responses. The basic unit of the Amdahl circuitry system is a "chip" made of silicon (which is a semi-conductor). Each silicon chip is approximately 154 thousandths of an inch square and ten mils thick—a little larger, but thinner, than a penny match head. Each chip contains anywhere from seventy-five to one hundred circuits: the high processing speed of the 470 results from this high density of circuits on each chip. Each chip is equipped with a cooling stud and fin to dissipate the great

FOLIO

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amount of heat generated by all these circuits. (Unlike the IBM 370/168, the Amdahl 470V/6 can be air-cooled; this reduces space requirements and the need for expensive water-cooling systems. The 470 generates so much heat, in fact, that some of it is being recycled and used to heat parts of the General Services Building.)

The silicon chips are mounted in circuit boards called "multi-chip carriers" (MCCs) and there are forty-two chips per carrier. All the circuits of the individual chips are interconnected into one system of about 3,000 circuits in each multi-chip carrier. In the CPU, there are fifty-one of these MCCs which in turn are all interconnected into one large system of about 150,000 circuits. Although this sound like a great number of circuits, it is significantly less than the number which would occur in a computer which did not use large-scale integration techniques. With the reduction of the number of circuits and the shorter distances for the electrical impulses to travel comes a reduction of the chances for circuit malfunction and an increase in the speed of operation.

The Amdahl 470V/6 is still in the sixty-day acceptance period; tests are being carried out and performance and reliability is being monitored. For users of the Computing Services facilities, conversion to the 470 will be a relatively simple matter. High level computer languages such as FORTRAN, COBOL, and APL will not require any changes to run properly on the Amdahl. Other, more specialized languages and programs may cause minimal problems, but special steps have been taken to deal with these.

One of the most significant differences users will encounter—it's hardly important enough to call a problem—is the fact that the Amdahl operates at speeds eight times faster than the computer users are accustomed to. Users will have to adjust to the new quickness of response of the 470V/6. Also, when they are estimating the amount of time required to do a job, users will have to reduce the amount of time to one-seventh or one-eighth of the estimate for the IBM 360/67. If users forget to make this adjustment, they could very well wipe out their budget in one computer run. Until the end of this fiscal year, computer time rates will be calculated by multiplying the rates on the old IBM 360/67 by eight since the Amdahl does eight times the work in the same amount of time. This means that the computer time will cost about \$1440 per hour. Of course, when using the Amdahl computer, it is not necessary to use as much time as on the IBM 360/67. Users will pay eight times as much for the computer time but they will only need one-eighth as much. Thus, the cost for a job should be comparable on the two machines.

This situation will continue until the end of

the current fiscal year; then computer time costs will drop. The Amdahl 470V/6 does not cost, in actuality, eight times as much as the IBM 360/67 to operate; it costs only about one and one-half times as much. This ratio of cost to work capacity is substantial, and the reduced costs will be a great help to many research budgets. The Amdahl 470V/6, with its economy and efficiency, will be of real benefit to the University's many teaching and research programs, and should prove to be a tremendous asset to this University.

BOARD OF GOVERNORS

The Board of Governors and its Executive Committee met on Friday January 9, 1976.

Management Advisory Institute Ratified

A report was received from the Senate regarding the Management Advisory Institute of the Faculty of Business Administration and Commerce. Seven months ago approval was granted authorizing a contract between the Government of Canada and the University which was to establish the Institute. Since then, representations have been received from several individuals and organizations who expressed their concern that the Institute would compete unfairly with the private consulting industry. In response, the Board requested the Senate to conduct an open hearing to investigate these complaints. The resulting Senate report expressed the opinion that the Faculty of Business Administration and Commerce could make a "significant contribution to the growth and development of Alberta business". The report endorsed the establishment of the Institute and made a number of recommendations. These were directed mainly toward ensuring adequate monitoring of the Institute against the possibility of its developing competition for the private consulting industry. A motion from President Gunning stating that the establishment of the institute be ratified by the Board and that the recommendations proposed by the Senate be adopted as guidelines was carried.

The following is a summary of the recommendations presented by the Senate to the Board:

1. The Committee, on the basis of its findings, is of the opinion that the Faculty can make, through the MAI, a significant contribution to the growth and development of Alberta business, and recommends to the Board of Governors that it approve the establishment of the MAI.
2. The Committee recommends that presentation of the second annual report be made the occasion for a substantial review of the operation and activities of the MAI for the

purpose of determining if the work of the MAI justifies the continued support of the Board of Governors or if it should be terminated.

3. As a further safeguard the Committee recommends that during the first two years of operation the Board of Governors should undertake to receive specific information about the type of contract entered into by the MAI. Approval of such contracts should remain with the MAI.

4. The Committee recommends that, in appointing members of the public to the Board of Directors of the MAI, the Board of Governors of the University include representatives of the following:

- (a) small and medium sized business
- (b) consulting firms which provide service to small and medium sized business
- (c) special interest groups who have expressed an interest in or who may be affected by the MAI such as the Association of Professional Engineers, Geologists and Geophysicists of Alberta, the Canadian Association of Management Consultants, the Institute of Chartered Accountants of Alberta, etc.

5. The Committee recommends:

- (a) that the MAI undertake a detailed study to identify the unfulfilled needs in Alberta for consulting services and the needs that are being met by out-of-province consultants; and
- (b) that it formulate and publish a long range plan for MAI's involvement in enhancing the consulting capability within this province.

6. In recognition of the historic involvement of the Faculty of Extension in continuing education for businessmen, the Committee recommends:

- (a) that a close relationship between the MAI and the Faculty of Extension should be established from the outset and that at least one member of the Faculty of Extension should be appointed to the Board of Directors and the Management Committee of the MAI;
- (b) that the MAI should not involve itself in activities or programs which would prejudice the work currently being carried out under the Faculty of Extension's continuing professional education program;
- (c) that the Faculty and the MAI be asked to give assurance to the University Board of Governors that the supply of teaching staff for the Faculty of Extension professional education program will be protected.

Name Change

The Board approved a recommendation from the University Planning Committee to change the name of *The Botanic Garden, The University of Alberta*, to *The University of Alberta Devonian Garden*. The Devonian Foundation, which will be assisting in the funding of the Garden, indicated its desire to be identified with the facility.

Appointments and Nominations

Jean Forest was nominated by the Senate to a second three year term as the Senate's representative to the Board of Governors. This nomination was received by the Board and will be forwarded to the Minister of Advanced Education and Manpower.

L.C. Leitch, Vice-President (Finance and Administration), was appointed as the University's representative to the Medical Finance Advisory Committee of the Department of Advanced Education and Manpower.

K.B. Newbould, Associate Dean of Science, was reappointed for a three year term as one of three representatives of the University to the TRIUMF Board of Management. The Board of Governors also ratified the appointment of W.A.B. Saunders, Deputy Minister of Housing and Public Works. He will replace J.T. Sample who has accepted an appointment as Director of TRIUMF. The third University representative to the TRIUMF Management Board is H.E. Gunning.

J.D. Earp of the Department of Psychiatry has been named as an alternate member to W.G. Dewhurst on the Provincial Mental Health Advisory Council. The appointment came on the recommendation of the Dean of Medicine.

R.P. Beck has been reappointed as Chairman of the Department of Obstetrics and Gynaecology for a period of five years from July 1, 1976.

Effective immediately R.E. McKown will assume the position of Chairman of the Department of Political Science. Her appointment will continue until June 30, 1978.

Rental Rates Increased

The Board has authorized the Administration to effect increases in the monthly unit rental rates for Michener Park. The average increase, which is to be implemented April 1, 1976, is about 13.5 percent. The increases were discussed with and endorsed by the Michener Park Residents' Association. The proposed increases are subject to approval within the context of the recently announced provincial rental guidelines. The rates were reported to be less than commercial rates even with the proposed increases.

Fee Increase

The Board approved an increase in membership fees for the Summer Session Students' Association from \$6 to \$8 effective July 1, 1976. The fee is a condition of registration for all students enrolled in Summer Session courses.

DISCIPLINARY HEARING ON ACADEMIC DISHONESTY

Second term has begun; term papers and exams will have to be written before its completion.

Particularly relevant at this time is a reminder to staff and students that there are regulations governing the writing of papers and exams and that the General Faculties Council *Policy Manual* prohibits cheating, plagiarism, fraud, deceit, or other forms of *academic* dishonesty. The penalty for a breach of the section may result in expulsion, suspension, or reprimand.

In order to make students and staff more aware of University regulations regarding academic dishonesty, M.M. Midgley, Secretary, General Faculties Council has requested that the following record of a disciplinary hearing be published.

General University Disciplinary Hearing

On December 18, 1975 a Tribunal consisting of Don Sommerfeldt (Law 2) in the Chair, Laura Enns (Education 4), and Geoff Williams (Administrative Systems) met to hear charges of cheating brought by the Dean of Engineering against a student in his faculty.

In the first charge, the student alleged that he had submitted two examination booklets although only one was to be found. The Tribunal found that only one had been submitted. In the second charge, the student alleged that he had handed in one examination and mistakenly taken away from the examination room a second booklet which he then put under the Professor's door the following day. The Tribunal found that the second booklet had been written after the examination was over and after the Professor had distributed an answer sheet to the examination questions.

The Tribunal unanimously agreed that the student be suspended from the University for a period of eighteen months. The student was then advised of his right to appeal.

The Tribunal also recommended that steps be taken to ensure that examinations be proctored with greater diligence so as to lessen the opportunity for cheating.

ELECTRICAL ENERGY COSTS

An article was published in the November 13 issue of the *Folio* regarding substantial increases in utility rates. The Department of Physical Plant has prepared some examples of costs of operation of typical electrical loads on Campus.

Lighting

In all cases the installations consist of two 40 watt fluorescent fixtures which were considered to be in use eight hours per day for every working day of the year.

Typical Area

Office:	6 fixtures	\$ 12/year
Classroom:	36 fixtures	\$ 72/year
Laboratory:	36 fixtures	\$ 72/year
Typing Pool:	114 fixtures	\$229/year
Reading Area:	138 fixtures	\$277/year
Cafeteria:	40 fixtures	\$ 80/year

Heating

Although a number of these installations are used only during winter months, they have the effect of increasing the overall winter system demand. This demand is known as the "billing demand"; once established it is applied every month throughout the year. The costs incurred by heating loads are:

- (a) Portable 1,500 watt heaters similar to those used under desks by secretaries and typists. \$84/year
- (b) Snowmelt installations on outside walkways and stairs. 30 KW. \$1,692/year
- (c) 1,000 cars plug in simultaneously at an average of 700 watts/car. \$39,480/year

If one or more of these loads can be switched off during the peak load period, considerable savings can result.

Buildings

The following are actual consumption figures of five Campus buildings taken from 1 November 1974 to 31 October 1975. The cost of this energy is arrived at by applying the current rate of 1.2 cents per kilowatt hour.

General Services:

3,814,800 KWHrs \$45,777/year

Students' Union:

7,316,200 KWHrs \$87,795/year

Cameron Library:

4,924,800 KWHrs \$59,098/year

Physical Education:

5,490,380 KWHrs \$65,884/year

Bio-Sciences Complex:

25,223,400 KWHrs \$302,908/year

The Department of Physical Plant is actively engaged in a number of programs aimed at reducing these costs; these include:

1. An Energy Systems Analysis (ESA) program, which is computerized and applied on a building by building basis. The objective of the program is to optimize the use of all energy consuming systems such as air conditioning, heating and electrical. ESA is also being applied to new buildings in the design stage by the Campus Development Office.
2. A building by building survey of lighting installations with the following objectives:
 - (a) replacing existing inefficient incandescent lighting with more efficient and less costly fluorescent lighting.
 - (b) reducing the number of existing fluorescent lighting fixtures where it is found that lighting levels exceed standard application requirements.
 - (c) reassessment of light switching arrangements to ensure only those lights needed will come on instead of a whole battery of lights on one switch.
3. An automatic load shedding program whereby non-essential loads can be cycled to reduce overall system demand and consumption.

All of the above programs are in the initial stages and will require a great deal of time and money to implement. The Department is asking staff and students to assist in reducing the operating costs and conserve our depleting resources by being more conscious of the energy shortage and escalating rates.

- (a) Turn out the lights when you leave the office.
- (b) Make more use of the light from windows.
- (c) Unplug or disconnect equipment that is not in use.
- (d) On days when the temperature is -6°C or above try leaving the car unplugged.
- (e) In offices or areas where a wall thermostat is installed, set it at 68°F and leave it there during the winter.

REMINISCENCES OF THE WUSC 1975 SEMINAR

The following report has been received from Susan El-Nahhas, a graduate student in Educational Foundations.

- As one of the two official representatives of the University of Alberta on the World University Service of Canada (WUSC) 1975 Seminar to Egypt, I spent two action-packed months in Egypt this past summer. A total of 50 students and five group leaders participated in the seminar. We were divided into five subgroups according to our area of interest—health and social welfare; education and women; agriculture, energy, and resources; tourism; and culture. As a member of the education and women group, I was looking into the present technical education program in Egypt at both the senior high school, college, and university levels. A newly established university of technology opened this past September, the University of Helwan. Technical education includes various aspects of agricultural, commercial, and industrial education from senior high school up to and including first university degree.

- After spending three days of orientation in Old Montreal, we departed on Quebec Air for Beirut with a connecting Air Egypt flight to Cairo. Due to unforeseen mechanical problems with the plane, our one hour stop-over in Beirut became one of more than fourteen hours. We were restricted to the inside of the four storey terminal building which, because of the civil war in Lebanon and the threat of Israeli invasion, was encircled both inside and outside by Lebanese Army regulars armed with rifles, bayonets, revolvers, and hand grenades. Some members of the group were prevented from approaching outside doorways and we all

felt trapped, as well as hot, dirty, and exhausted.

After we arrived in Cairo at 2 a.m. and were being driven to our downtown hotel, we were deeply impressed by the coolness of the July night and the large, exclusive villas we saw along the road through Heliopolis, a rich Cairo suburb. It is impossible to write more than a fragmentary account of impressions and experiences during our two month stay in Egypt. "Welcome to Egypt" and "welcome to our city" were constantly heard from Egyptians who spoke only a few words of English. Their great enthusiasm towards us was encouraging and heartening. The people of Egypt seemed extraordinarily cheerful in the face of widespread poverty and hardship. Members of the seminar were able to meet and mix with Egyptians of every social class and color both in the urban centers and rurally in both Upper and Lower Egypt. I feel my greatest personal experience came from spending time in many rural villages in both Upper and Lower Egypt, including two Nubian villages near Aswan. The people were extremely friendly and interested in communicating with us. Most Nubian men we met spoke Arabic, English, and French, as well as their own language, Nubian—even though most of them were illiterate.

Our seminar coordinated activities with Cairo University and so we had contact with some professors and students there. We were able to use the libraries and museums in Cairo for research purposes as well.

We did a lot of travelling, especially at the beginning and end of the seminar. We spent several days in places such as Luxor, Aswan, the Aswan High Dam and Lake Nasser, Fayyum, Cairo, Alexandria, El Alamain, and the Suez Canal. Near Luxor we were able to walk through the Temples of Luxor and Karnak, the Valley of the Kings, the tomb of Tutankhamun, and various other tombs of the nobles. The suqs (markets) of Upper Egypt were fascinating and most of us enjoyed them more than those of Cairo. The High Dam was very impressive, as were the rose-red granite quarries of Aswan, the Temple of Philae, and the mausoleum of the Aga Khan. Several seminar members flew to see the relocated mighty temples of Ramses II at Abu Simbel, 280 km south of the Aswan High Dam.

Dr. David McLay, group leader for agriculture, energy, and resources, commented that one of the most unforgettable experiences we had in Egypt was crossing the swift-flowing Nile in an armada of filukas manned by singing Nubian sailors, and standing on a peak in the Western Desert with a magnificent panorama of Aswan city, the Nile River, Elephantine Island, the first cataract, the endless dunes of the Western Desert, and the forbidding crags of the Nubian Desert. Aswan

marks the upper limit of human habitation in Egypt at present and the fertility of the Nile Valley disappears just above the city leaving only two deserts to form the banks of the swift-flowing river.

After spending nearly three weeks in Cairo, the group went to Alexandria for ten days, taking the 200 km long highway through the rich agricultural lands of the delta and returning to Cairo via the hot, tiring 220 km desert road around the salt lake of Mariut. Students met professors and students at Alexandria University, took trips to the port, to museums, attended several Egyptian weddings, toured factories (copper, cotton, paper), and visited the reclaimed lands of North Tahrir (Liberation) province.

Another memorable part of the trip was an excursion through the Arabian Desert to Suez city, the Suez Canal Zone, the Bar-Lev line, and the western border of the Sinai peninsula (including a visit to Moses' springs and tours of captured Israeli positions conducted by a colonel of the Egyptian Army). While we had all been told repeatedly by Egyptians of all classes and backgrounds that the war with Israel had been a continuing drain on Egypt since 1947, it took an inspection of the total destruction of apartment buildings, homes, and mosques in Suez city to bring home to us some of the reality and horror of war.

By the latter part of August, the formal part of the seminar was over and participants were free to remain in Egypt or travel elsewhere for the last two weeks of the trip. Many went to Alexandria, Greece, Lebanon, or Turkey. I spent this period in Lebanon with friends I have there.

When the group was reunited in Beirut for the flight back to Montreal, nearly everyone was reluctant to leave the Middle East. Despite the many problems some of us faced there, we felt it had been a significant and meaningful experience to live in the Middle East for two months.

I personally would urge any university student who is interested in the experience of living in an underdeveloped country for a couple of months in a group arrangement to enquire about the next WUSC Seminar 1976 by contacting Ruth Groberman, Foreign Student Advisor, 2-5 University Hall (432-4145) or myself, Susan El-Nahhas at 432-4440. I shall be speaking about some of my experiences in Egypt at a SUB forum, Tuesday, January 20 at 12:30 p.m. in Education II 2-115.

PEOPLE

- Joseph R. Royce, Director of the Centre for Advanced Study in Theoretical Psychology,

presented an invited address entitled "Three Ways of Knowing and the Scientific World View" at the Fourth International Conference on the Unity of the Sciences held in New York from November 27 to 30.

■ Karol Krotki, Professor of Sociology, consulted with the World Health Organization in Geneva on surveys of infant and child mortality the Organization is sponsoring in several less developed countries. Field work in Afghanistan has been completed.

■ Margaret Midgley, Administration Officer of the President, has been appointed Special Assistant to the President and Secretary to General Faculties Council effective December 1.

■ John King-Farlow, Professor of Philosophy, was recently elected Councillor for 1976 by the Association of Philosophy Journal Editors. Dr. King-Farlow, an Editor of the *Canadian Journal of Philosophy*, will also serve for another year as the Canadian member of the Editorial Board for the microfilm organ, *Philosophy Research Archives*.

■ Barbara L.C. Brodman, Visiting Professor of Spanish in the Department of Romance Languages, presented a paper entitled "The Changing Role of Women in Chilean Society" at the annual meeting of the Philological Association of the Pacific Coast held in San José, California from November 28 to 29.

■ Norma Gutteridge, Executive Editor of The University of Alberta Press, has an article on Prairie Publishing in the December issue of the *Canadian Library Journal*. Mrs. Gutteridge has been elected Vice-President of the Alberta Publishers' Association.

■ C.H. Preitz, Professor of Industrial and Vocational Education, has been elected to the Board of Directors of Epsilon Pi Tau, Incorporated. Epsilon Pi Tau is an International Honorary Fraternity for men and women in Industrial Education.

■ L.C. Green, University Professor in the Department of Political Science, addressed the Student Christian Movement Western Regional Conference on Land Claims on "The Treaties," December 30.

VISITORS

■ Visitors to the Theoretical Physics Institute during the fall term included: C. Domb, University of London King's College, United Kingdom; A.J. Guttman, University of Newcastle, Australia; J. Oitmaa, University of New South Wales, Australia; A. Opie, University of New South Wales, Australia; H.P. Baltes, Technical University, Lausanne, Switzerland; D.K. Finnemore, Iowa State University, United States; F. Tanako, Tokyo University of

Education, Japan; J.C. Thompson, University of Texas at Austin, United States; A.D. Boardman, University of Salford, United Kingdom; W.Y. Yiu, University of Dortmund, Federal Republic of Germany.

NOTICES

TELEPHONE SECRETARY SET UP FOR SEXUAL ASSAULT VICTIMS

The Committee on Sexual Assault has set up a telephone secretary in order to gather information on sexual assaults in the University area. The secretary, at 432-3225, will record your responses (see *Folio*, January 8), or, if you would prefer to talk to a person, you may leave information about how you should be contacted. This is *not* an emergency or rape crisis line.

WOMEN'S STUDIES SAMPLER

In an effort to determine if there is interest in (and thus a need for) women's studies programs at the University, the Academic Women's Association is sponsoring a series of noon hour lectures on various aspects of women's studies. The lectures which are free and open to everyone will be held on Fridays throughout January, February, March, and April. The AWA hopes to use the response by students to these lectures as an indication of the need for women's studies programs at this University.

A wide range of topics will be covered:
January 16 "Women's studies and a 'traditional' career."

January 23 "Sociology of sex roles."

January 30 "Is biology destiny?"

February 6 "Psychology of sex differences."

February 13 "Women's history as an academic discipline."

February 20 "Psychological aspects of women in sport."

March 5 "Women in the Soviet Union today."

March 12 "Assertiveness training for women."

March 19 "Venereal disease as it affects women."

March 26 "Shakespeare's Cleopatra."

April 2 "Who's Afraid of Virginia Woolf?"

The lectures will be held in 280 Students' Union Building from 12 noon to 1 p.m. Students who involve themselves in the series will be expected to sign up initially and to agree to complete an evaluation of the series at the end.

EDMONTON RECORDER SOCIETY

The Edmonton Recorder Society will meet on Friday, January 16 at 8 p.m. in the Southwest Cultural Centre, 115 Street and 74 Avenue. Dayna Fisher will give a talk on "Phrasing and articulation of Baroque music." For further

information, please call Louise Dawson at 434-0091.

DAY CARE VACANCIES

The University Hospital has openings for eight children at its Day Care Centre. These openings are being offered to children of University staff members.

The Centre, located directly west of the Nurses' Residence, is designed to accommodate forty-two children aged three to six years. It is open from 6:30 a.m. to 5:30 p.m. Monday through Friday and is closed on statutory holidays. The enrolment fee is \$55 for each two week period. For further information, call the Centre Supervisor at 433-9663.

INTERNATIONAL FOLK DANCE

The Edmonton Parks and Recreation Department is sponsoring ten weeks of instruction in international folk dancing. Dances include waltzes, polkas, schottisches, kolos, syrtos, horas, and others. The classes begin on January 22 and continue on Thursday evenings from 8 p.m. to 10 p.m. at the McKernan Community Hall, 78 Avenue and 114 Street. The fee for the class is \$5.

CREDIT UNION

The University of Alberta Credit Union invites University staff members to drop into WB10 Chemistry Building or to phone 432-3256 for information about the services provided.

PROPHYLAXIS

The School of Dental Hygiene is accepting patients, both children and adults, for prophylaxis (cleaning of teeth). For more information, please phone 432-4151.

BOOSTER SERVICE

Holders of University parking permits are reminded that a battery boosting service is available from 3 p.m. to 6 p.m. Monday through Friday (holidays excepted) whenever the temperature drops to -23 degrees Celsius or colder. Please call the Department of Physical Plant at 432-4833 for this service.

THIS WEEK AND NEXT

Listings must reach the Editor by 9 a.m. the Friday prior to publication. Written notification is preferred.

15 JANUARY, THURSDAY

Gallery Cinema

7:30 p.m. *Don't Look Now* (Great Britain, 1973). Starring Julie Christie and Donald Sutherland. Downstairs, Edmonton Art Gallery. Admission \$2.

16 JANUARY, FRIDAY

Women's Studies

12 noon. "Women's studies and a 'traditional'

career" by Doris Badir, Associate Professor of Household Economics. 280 SUB. Admission free. First lecture of a series sponsored by the Academic Women's Association.

Faculty Club

Downstairs. "Maggie and Jiggs Night." Corned beef and cabbage, mashed potatoes, green salad, and apple Betty. \$3.95. Entertainment: Juke box selections.

Upstairs. Lobster \$11.50. Also regular dinner menu. Reservations required.

Student Cinema

7 p.m. and 9:30 p.m. *Mandingo* (United States, 1975). Starring James Mason, Susan George, and Perry King. Students' Union Theatre. Tickets \$1 advance or \$1.50 at the door.

Gallery Cinema

7:30 p.m. *The King of Marvin Gardens* (United States, 1972). Starring Jack Nicholson and Bruce Dern. Downstairs, Edmonton Art Gallery. Admission \$2.

Concert

8 p.m. Henry Mancini performs at the Jubilee Auditorium. Tickets available from the Bay Box Office, phone 424-0121.

17 JANUARY, SATURDAY

Wrestling

10 a.m. University of Alberta Invitational Wrestling Tournament. Main Gymnasium.

Faculty Club

Downstairs. Roast Beef, mashed potatoes, country gravy, and peach pie. \$4.50.

Upstairs. "Malanka Celebration." Apertif, dinner, wine, and dancing. \$17.50 per person. Entertainment: The Echoes. No regular dining this evening. Limit of six persons per club member.

University Concert Hall

And every Saturday. 6:45 p.m. A radio program of music from the University of Alberta on CKUA AM and FM.

Student Cinema

7 p.m. and 9:30 p.m. *Mandingo* (United States, 1975). Students' Union Theatre. Tickets \$1 advance or \$1.50 at the door.

18 JANUARY, SUNDAY

Gallery Cinema

2 p.m. *Siddhartha* (United States, 1973). Downstairs, Edmonton Art Gallery. Admission \$2.

Hockey

2:30 p.m. The Golden Bears versus the University of Saskatchewan Huskies. Varsity Arena.

'In Touch with U'

And every Sunday. 3 p.m. A program to



Richard Kerr

introduce the University to the community at large. CITV channel 13, cable 8.

Student Cinema

7 p.m. and 9:30 p.m. *Mandingo* (United States, 1975). Students' Union Theatre. Admission \$1 advance or \$1.50 at the door.

19 JANUARY, MONDAY

Plant Science Seminar

1 p.m. "Wild oat control with herbicide combinations" by P.A. O'Sullivan. 490 Agriculture Building.

20 JANUARY, TUESDAY

Physics Lecture

3:30 p.m. "Earthquake prediction in China" by E.R. Kanasewich, Assistant Chairman, Department of Physics. P445 Physics Building.

21 JANUARY, WEDNESDAY

Botany Seminar

4:30 p.m. "Sources of C-1 units in *neurospora crassa* wild type and in mutants partially deficient in serine hydroxy-methyltransferase" by Edwin Cossins. CW230 Biological Sciences Building.

Student Cinema

7 p.m. and 9:30 p.m. *The Music Lovers* (Great

Britain, 1970). Directed by Ken Russell, starring Richard Chamberlain and Glenda Jackson. Students' Union Theatre. Tickets \$1 advance or \$1.50 at the door.

Edmonton Chamber Music Society

8:30 p.m. The Canadian Brass performs works by Bach, Purcell, Debussy, Violet Archer, and Scott Joplin. Convocation Hall, Arts Building. Season members only.

Jazz

8:30 p.m. The Keith Jarrett Quartet performs at the Jubilee Auditorium. Tickets from Mike's, phone 424-8911, or the Students' Union Box Office.

22 JANUARY, THURSDAY

Classics Seminar

4 p.m. "Catharsis: poetic or anti-poetic?" by R.N. Bosley, Associate Professor of Philosophy. 1-8 Humanities Centre.

Biology Seminar

4:30 p.m. "Brain and the ordered state" by Hiroomi Umezawa, Killam Professor of Physics. CW410 Biological Sciences Building.

Gallery Cinema

7:30 p.m. *Willard* (United States, 1971). Downstairs, Edmonton Art Gallery. Admission \$2.

folio accepts display advertising

Size and rates: the basic unit size is 45 agate lines x 15 picas (3¼" x 2½"). The full page is divided into 9 such units, any combination of which is available at a cost of \$20 per unit. Half pages cost \$100. A professional/business card unit (2½" x 1½") is available at a cost of \$12. Discounts are offered for extended runs; please enquire.

Other specifications: half-tones (100-line screen or less) are acceptable; no color or bleeds. Camera-ready copy is preferred; there is a charge of 15c per word for typesetting, and \$5 per line for design of work which is not camera ready. Deadline for submission is one week prior to publication (Thursday, 4 p.m.) for camera-ready copy; 10 days for all other advertising copy. Positioning is at the discretion of the editor.

Contact: Richard Kerr or Esther Fraser, 326 Assiniboia Hall, The University of Alberta; telephone 432-4991.

23 JANUARY, FRIDAY

Women's Studies

12 noon. "Sociology of sex roles" by Rosalind Sydnie, Assistant Professor of Sociology. 280 SUB. Admission free.

Faculty Club

Downstairs. "TGIF: The Persian Version." Lamb shiskabob, rice pilaf, salads, and fruit tray. \$4.25. Entertainment: Juke box selections. **Upstairs.** Regular dinner menu. Reservations required.

Gallery Cinema

7:30 p.m. *The Boys in the Band* (United States, 1970). Downstairs, Edmonton Art Gallery. Admission \$2.

Hockey

8 p.m. The University of Alberta versus the University of British Columbia. Varsity Arena.

Volleyball

8 p.m. The University of Alberta versus the University of British Columbia Thunderbirds. Main Gymnasium.

Dance

8:30 p.m. The Alberta Contemporary Dance Theatre performs in the Students' Union Theatre. Students \$3 and non-students \$4. Tickets available from all Bay outlets and the Students' Union Box Office in HUB Mall.

24 JANUARY, SATURDAY

Faculty Club

Downstairs. "Club Trattoria." Veal scallopini, noodles, crisp green salad, and Roman coffee cream. \$4.25.

Upstairs. "Robbie Burns Night." Haggis, scotch broth, prime rib of beef, skirlie, neeps, tatties, scones, Scottish cheeses, and Highland soufflé. Highland cocktails at 6:30 p.m. \$8.50. The evening features Piping in the Haggis by J. Fryer, Scottish dancing by the University's Scottish Dance Club, and the Address to the Haggis by R. Grant. Entertainment: Gordon Schmidt Band.

Hockey

8 p.m. The University of Alberta versus the University of British Columbia Thunderbirds. Varsity Arena.

Dance

8:30 p.m. The Alberta Contemporary Dance Theatre performs in the Students' Union Theatre. Students \$3 and non-students \$4. Tickets available from all Bay outlets and the Students' Union Box Office in HUB Mall.

Edmonton Symphony Orchestra

8:30 p.m. The ESO conducted by Pierre Hétu, featuring Robert Aitken, flute, and Judy Loman, harp, performs works by Schoenberg, Prokofiev, and Saint-Saëns. Loman and Aitken

will perform the *Harp and Flute Concerto* by Mozart. Jubilee Auditorium. Tickets available from the Bay Box Office and the Symphony Box Office, phone 433-2020.

EXHIBITIONS AND PLAYS

Citadel Theatre

17 January to 21 February. *The Sunshine Boys* by Neil Simon, a play about two former vaudeville entertainers who, though they are no longer friends, must get together again. Starring Guy Sanvido and Mickey Costello. Citadel Theatre. Performances Tuesday through Saturday at 8:30 p.m. with Sunday performances at 2:30 p.m. and 7:30 p.m. Casual tickets available by phoning 424-2828.

Edmonton Art Gallery

Until 18 January. "The Collective Unconscious," a display of works by key figures in the North American avant-garde of the 1940s and 50s.

Until 15 January. "William Ronald," a display of works by the Canadian abstract expressionist.

Until 15 January. "Towards a New Theatre: Edward Gordon Craig and *Hamlet*." This exhibit features the most famous and representative design project of an artist who profoundly influenced theatre design.

Until 20 January. "Shout in Silence: Visual Arts and the Deaf," a special display of paintings and graphics by deaf and hard-of-hearing children and adults.

Until 18 January. "Father and Son," an exhibit of watercolors by William Christian Symons and his son, R.D. Symons.

Opening 16 January. "Lyndal Osborne," a one-person exhibition featuring large air-brush drawings.

Opening 16 January. "Gary Olson," a one-person display of larger-than-life graphic portraits.

Provincial Museum

Until 30 January. "Peter Karsten and Charles Lacy: Alberta Nature Art," an exhibit featuring these two Alberta artists. Feature Gallery 1.

Until 15 February. "Winter Outdoors—Yesterday and Tomorrow," a feature exhibit emphasizing the many winter activities available in Alberta. Feature Gallery 2.

Continuing. "Documentary Heritage," a long-term exhibition displaying valuable manuscripts and documents in the Provincial Archives of Alberta. Archives Gallery.

U of A Camera Club

15 and 16 January. A slide and print show of black-and-white and color photography by members of the Club. Judging will take place. The display is open from 10 a.m. to 7 p.m. SUB Art Gallery, Students' Union Building.

Northern Light Theatre

Until 23 January. A special lunch-hour dance program performed by the Alberta Ballet Company. Monday through Friday at 12:10 p.m. with extra performances on Thursday and Friday at 1:10 p.m. Edmonton Art Gallery Theatre. Admission \$1.50.

Citadel Too

Until 24 January. *Hosana* by Michel Tremblay; a play about the relationship between a transvestite and a homosexual. Monday through Saturday at 8 p.m. 10018 102 Street. Admission \$3 regular, \$2 for students. Tickets available from the Citadel Box Office, phone 424-2828.

Theatre Francais d'Edmonton

16, 17, 18 et 23, 24, 25 janvier. *En pièces détachées et La Duchesse de Langeais* de Michel Tremblay. Collège Universitaire Saint-Jean, 8406 91e rue. Pour renseignements et billets: 469-0829.

NON-CREDIT COURSES

MANAGEMENT OF PERSONAL FINANCES

In this course the focus is upon the personal management of financial resources within the existing economic conditions. Included in the program is personal and family budgeting, consumer credit, investment, insurance principles and application, will and estate planning, and an overview of the Income Tax Act.

The course commences February 4, 1976 and will run twelve Wednesdays. The fee of \$45 includes materials. Registrations will be accepted until the class limit has been reached. No cancellations will be accepted after January 30, but substitutions can be made until the date of the course. For further information call 432-5066 or 432-5067, the Faculty of Extension.

EVERYDAY LIFE IN THE PEOPLE'S REPUBLIC OF CHINA

A look at family life, education, medical care, agriculture, industry, politics, religion, sports, culture, and entertainment in China. Extensive use will be made of slides, records, posters, and art from the instructor's private collection. Brian Evans of the Department of History will conduct the course beginning February 4 and running eight Wednesdays. The fee is \$25 and registration will be limited to forty persons. For further information contact the Faculty of Extension at 432-5055.

PROSPECTING II

This is an advanced study of prospecting and while there are no formal prerequisites, it is

strongly recommended that participants should have already taken Prospecting I, Rock and Mineral Identification, or University geology courses in order that they may gain full benefit from the course. Topics to be covered are geological maps and reports, aerial photography, prospecting methods, geochemical and geophysical exploration, sampling of mineral prospects and assays, staking and surface development, mining economics and mine making possibilities, placer mining, and marketing and finance.

Beginning January 19 the course will meet twice a week for five weeks. The fee of \$55 includes textbooks and lecture notes. Registration can be made in 228, Corbett Hall and additional information can be obtained by calling 432-5532 or 432-5061.

GRADUATE SCHOLARSHIPS AND AWARDS

CIDA Awards

Eligibility: these awards are available to Canadian citizens who have completed a post-secondary program of studies, and who indicate their intention to pursue an active career in international development work. *Preference:* the primary purpose of the scheme is to assist those whose career choice is in the field of international cooperation. Preference will therefore be given to applicants who have already indicated their commitment by working in development programs. Their experience may have been gained with public or private, international or domestic development programs. *Term and tenure:* the program may start any time after April 1, 1976. Awards will normally be tenable for a two-year period and continuation from year to year will be subject to a review of the award holder's program and performance. The Scholarship Committee may extend an award beyond this period of time, but in no case for more than one additional year. In this case, the award holder will have to demonstrate that the program schedule could not be met due to circumstances beyond his control. The academic part of the program is tenable in Canada and/or in a developing country. Studies in another developed country may be approved when the program is not available in Canada; this fact must be documented by the applicant. *Value:* the value of each award may be up to the amount of \$11,500 per annum. The scholarship is payable on a non-accountable basis and includes the living allowance, provision for books, tuition, travel, and research costs related to the project. Monies disbursed by CIDA to or on behalf of the holders of these awards are subject to Canadian tax laws and may be subject to the tax laws of countries in which the study or work will be undertaken. *Study/research program:* because of the nature of the CIDA award, particular emphasis is placed upon the information provided by the applicant under this heading. The proposals made by the applicant will be the major factors in the selection of award winners. Each applicant is required to develop a program that is of a maximum duration of two years. The proposal may include an academic portion, but must include a substantial period of work, observation, or research in a developing country. In other words, the program must have a practical orientation and should not be used exclusively for academic or theoretical studies. Particular attention is drawn to the fact that each

applicant must outline his program as fully and clearly as possible and include a chronological summary of his/her planned activities. Furthermore, each candidate must secure the sponsorship of a supervisor of studies in a Canadian institution of higher education or an expert who is prominent in the field selected who will submit to CIDA periodic evaluations of the progress made by the candidate. Indication to undertake this sponsorship must accompany the application. Preference will be given to applicants who have demonstrated through their academic background or experience that they have acquired a sufficient knowledge of problems or priorities of developing countries to conduct their project successfully. The project submitted must be directly related to concrete needs of a developing country(ies). *Intention on completion:* it is the purpose of this scholarship scheme to encourage those who are seeking to further a career in the international development field. Each applicant is asked to provide a clear and concise statement of his or her career aspirations and intentions in this respect. *References:* each candidate is required to provide letters of reference from three persons. One of these forms must be completed by a person under whom the candidate has studied or/and his present employer; another one will be completed by the proposed program supervisor. These letters should analyze the project and deal with its practicability. As these letters are confidential, sponsors are requested to send them directly to CIDA. Applicants should request their sponsors to use the form letters which are attached to the application forms. *Transcript of marks:* the candidate must ensure that official transcripts of his last completed academic year are forwarded to CIDA. The applicant is responsible for any fees related to the procurement and dispatch of these transcripts. *Citizenship:* only Canadian citizens are eligible for this award. A copy of an applicant's birth or citizenship certificate must accompany the application form. *Other income:* a scholarship winner may not hold any other award or receive any other income from the *Federal Government* concurrently with this award. *Number:* twenty-five. *Closing date:* January 31, 1976. *Announcement of results:* beginning of March 1976. *Applications can be sent to:* Canadian International Development Agency, Human Resources, 122 Bank, Ottawa K1A 0G4.

Jerusalem Research Scholarship/Travel Grant British School of Archaeology in Jerusalem Research Scholarship

A research scholarship of £1,350 is offered for full-time research into some aspect of Levantine archaeology, history, architecture, or epigraphy of any period from the prehistoric to the Islamic. Applicants are required to submit a summary of their proposed research, which should normally be of a post-graduate standard. The research should be of such a nature that residence in the area covered by the School's interests (Jordan, Syria, Lebanon, Israel) is essential, and the scholar will be expected to spend at least eight months in the area. Those needing advice on subjects for research may consult the Director of the School. The scholar will be expected to produce a report suitable for publication within two years of the conclusion of the period for which the award has been made.

Travel Grant

A travel grant of a sum not exceeding £500 is also offered to enable a student to participate in the School's excavations or to gain experience in a related field. Short term projects will also be considered.

Applicants for both awards should be citizens of a country of the British Commonwealth, and for the research scholarship should normally be graduates of a university of the British Commonwealth. Applications, preferably typewritten on one side of the paper only, should state the candidate's age, academic qualifications and experience, and be accompanied by the names and addresses of two persons, acquainted with the candidate's work, to whom reference may be made.

Applicants may be asked to attend in London for an interview, probably in March 1976. Applications should be addressed to: The Assistant Secretary, The British School of Archaeology in Jerusalem, 2 Hinde Mews, Marylebone Lane, London, W.1., and should be received by February 16, 1976. Letters to the Director should be addressed to Mrs. C-M. Bennett, British School of Archaeology in Jerusalem, P.O. Box 19283, Jerusalem, Israel.

**Mackenzie King Travelling Scholarship/
Open Scholarship
Travelling Scholarship**

Four or five scholarships of not less than \$3,500 each will be available for study in the fall of 1976. Scholarships are open to graduates of any Canadian university seeking to study at the graduate level in the United States or United Kingdom. The field of study shall be International or Industrial Relations (including the international or industrial aspects of Law, History, Politics, or Economics). Awards will be made by, and at the discretion of, the Board of Scholarship Trustees.

Applications and all documents pertaining to them must be forwarded no later than February 15, 1976. Each candidate is required to forward the following: an unmounted professional photograph (head and shoulders); a brief biographical outline which includes place and date of birth and details of education, employment, achievement, etc.; a list of theses, papers, reports of investigations, etc., published or unpublished. If published, reference to their location should be supplied; a list of the names and addresses of those forwarding documents and letters on behalf of the candidate; a letter stating the grounds on which the applicant desires his or her application to be considered. In this letter the applicant should also describe the program of studies which he or she intends to pursue, indicate at what institution these studies are to be taken, and outline his or her future plans for a career; a statement from the President or Principal, or his nominee of the university where the candidate obtained his or her highest degree or is engaged in academic teaching or research. This statement should indicate the applicant's fitness for the scholarship with respect to health, character, and general ability; official transcripts of the applicant's academic record, signed by the registrars of the universities at which he or she has studied; three testimonials from persons who have an intimate knowledge of the applicant's record and ability and are able to give a critical evaluation of his or her plans for post-graduate study. At least two of these testimonials must be from persons under whom the applicant has taken his or her major work at university, or from senior colleagues with whom he or she has been associated in academic teaching or research. Applications and documents can be forwarded to the Awards Office, Room 207, Buchanan Building, The University of British Columbia, Vancouver, B.C. V6T 1W5.

Open Scholarship

A one-year scholarship of \$3,500, open to graduates of any Canadian university, is offered in competition for full-time post-graduate studies in Canada or elsewhere and in any field.

An applicant must be nominated by the Dean of Graduate Studies (or similar appropriate officer) of the Canadian university most recently attended by the applicant. On behalf of the applicant, the Dean should forward a file consisting of (a) official transcripts of the applicant's academic record at all post-secondary institutions attended; (b) letters of reference from two persons who are able to evaluate critically the record, ability, and personal qualities of the applicant; (c) a brief biographical sketch from the applicant including specific details of his or her plans, if awarded a scholarship. The Dean of Graduate Studies should forward the file to the Awards Office, Room 207, Buchanan Building, University of British Columbia, Vancouver, B.C. V6T 1W5. The file must be received by February

15, 1976. If more than one application file is forwarded, the Dean should indicate the order of merit in which he ranks the applicants.

**Gonville Research Studentships
Gonville and Caius College, Cambridge**

Value: will be determined after considering successful candidates' income from other sources. Successful candidates will receive up to £1,185 a year if they are from the United Kingdom, or up to £1,235 if they are from outside the United Kingdom, together with approved University and College fees. All successful candidates will have the right, if unmarried, to live in College during their first year of residence in Cambridge. An additional allowance may be made to older students or those with suitable postgraduate experience, and dependants' allowances at the same rates as those fixed by the Department of Education and Science, Science Research Council, or Social Science Research Council (as appropriate) may also be paid to Students who do not qualify for dependants' allowances from other sources. *Duration:* the award of a Studentship may be conditional upon the candidate's obtaining satisfactory results in his final degree examination. Successful candidates will become members of the College, and will be expected to come into residence in October 1976. The Studentships are renewable annually up to a maximum of three years, subject to conditions of diligence and progress. *Where tenable:* the University of Cambridge. *Level of study:* candidates must be prospective candidates for a research degree at graduate level. *Conditions:* candidates must be male, under the age of thirty on October 1, 1976, and graduates of the University of Cambridge or any other university in the United Kingdom or elsewhere, or be about to graduate not later than August, 1976. Tenure of a Studentship is conditional upon the elected student being accepted by the Board of Graduate Studies. *Closing date:* April 1, 1976. *Further information and application forms:* should be requested from the Admissions Tutor, Gonville and Caius College, Cambridge, CB2 1TA.

All enquiries regarding the following should be directed to L. Henderson, Administrator of Student Awards, 219 Central Academic Building, 432-1495.

**Doctoral Dissertation Fellowships
in Natural Resources**

Resources for the Future, Inc.

Value: \$4,500 plus \$500 for married fellows with children. *Where tenable:* Canada and the United States. *Level of study:* doctoral. *Field of study:* must involve the Social Sciences or related fields of study. *Number:* variable. *Duration:* one academic year. *Conditions:* fellowship candidates must be nominated by the academic department; direct applications will not be accepted. Nomination forms for submission are supplied only to the chairmen of eligible departments. A department may nominate more than one candidate. *Closing date:* February 1, 1976. *Further information and application forms should be requested from:* Fellowship Program, Resources for the Future, Inc., 1755 Massachusetts Avenue, N.W., Washington, D.C. 20036.

INCO Graduate Research Fellowships

The International Nickel Company of Canada

Value: \$4,500 or \$5,500 per annum. *Where tenable:* Canadian universities. *Level of study:* post-graduate fellowship. *Field of study:* Chemistry or Physics of metals or minerals, Geology (including Geophysics and Geochem), Metallurgy, Mineral Processing, and Mining. *Number:* variable. *Duration:* possible tenure of three years. *Conditions:* letters of application from interested students must be submitted through the Student Awards Office. *Closing date:* applications must be submitted to Toronto before February 20, 1976.

Imperial Oil Graduate Research Fellowships

Value: total \$12,000. *Number:* six. *Where tenable:* any approved university. *Level of study:* graduate. *Field of study:* pure and applied natural and/or exact sciences. *Duration:* three years. *Conditions:* Canadian citizen, graduate of any approved university for research leading to a doctor's degree in the fields of study mentioned. Application shall be made on a prescribed form and each application must be endorsed by the authorities of the participating university. *Closing date:* nominations must be in Toronto by February 1, 1976. Further information and application forms should be requested from the Student Awards Office.

**J.H. Stewart Reid Memorial Fellowship
Canadian Association of University Teachers**

Value: \$3,000. *Where tenable:* any Canadian university. *Level of study:* graduate. *Field of study:* unrestricted. *Number:* one. *Duration:* one year. *Conditions:* Canadian citizenship with graduate student standing or admission to a Canadian graduate program by the time of award. *Closing date:* February 1, 1976. *Further information and application forms should be requested from:* Awards Officer, Canadian Association of University Teachers, 66 Lisgar Street, Ottawa, Ontario K2P 0C1.

POSITIONS VACANT

NON-ACADEMIC STAFF

To obtain further information on the following positions, please contact Personnel Services and Staff Relations, third floor, SUB, telephone 432-5201. Please do not contact the department directly.

Clerk Xerox Operator (part-time) (\$275/month)—Educational Psychology
Clerk Steno I (\$505-\$599)—Audiovisual Media Centre
Clerk Typist II (\$505-\$627)—Educational Administration; Faculty of Education; Student Programs and Records; Provincial Laboratory
Clerk Steno II (\$527-\$653)—Economics; Secondary Education; Extension (trust); Business Administration and Commerce
Dental Assistant (\$551-\$683)—Dentistry
Timetable Scheduling Clerk (\$576-\$713)—Office of the Registrar
Clerk Typist III (\$576-\$713)—English; Secretariat; President's Office
Clerk Steno III (\$599-\$744)—Comparative Literature (term); R.S. McLaughlin Research Centre (trust); Botany; Agriculture and Forestry, Dean's Office; Mineral Engineering; Educational Psychology; Physics
Data Entry Operator I (\$599-\$744)—Computing Services
Library Assistant I (\$627-\$779)—Geology
Accounts Clerk II (\$653-\$814)—Office of the Comptroller
Secretary (\$683-\$853)—Computing Science
Administrative Clerk (\$713-\$891)—Chemistry
Timetabling Clerk (\$744-\$932)—Office of the Registrar
Departmental Secretary (\$779-\$975)—Immunology
Typographical Trainee (\$505-\$627)—Duplicating
Technical Assistant (\$627-\$779)—Pharmacology
Accounts Clerk II (\$653-\$814)—Bookstore
Typographical Tradesman I (\$653-\$814)—Duplicating
Control Clerk (\$653-\$814)—Office of the Registrar
Technician-Technologist I (\$713-\$1,020)—Paediatrics (trust)
Technician I-II (\$713-\$1,020)—Household Economics
Technologist I (\$814-\$1,020)—Pathology
Biochemical Technologist I (trust) (\$814-\$1,020)—Cancer Research Unit
Electronics Technician II (\$853-\$1,068)—Physical Education

Electronics Technician III (\$975-\$1,225)—Physics
Projects Estimator (\$1,118-\$1,406)—Physical Plant

The following is a list of currently available positions in the University Library. The bulletin board postings in the Library Personnel Office, 516 Cameron Library, should be consulted for further information as to position requirements and availability.

Library Clerk I (\$505-\$627)—Acquisitions
Library Clerk III (\$576-\$713)—Cataloguing (5 positions); Cameron Reserve Reading Room
Library Assistant I (\$627-\$779)—Selections
Library Assistant II (\$713-\$891)—Cataloguing

OFF-CAMPUS POSITIONS

Senior Research Fellow/Research Fellow Department of Law, Australian National University Research School of Social Sciences

The Department is concerned with research in depth into legal problems, with an emphasis on the relation of legal studies to other social studies and in active collaboration with the other departments of the research Schools of Social Sciences and Pacific Studies. At present, the emphasis of the Department is on common law, criminal law, and primitive and comparative law, but special consideration will be given to applicants particularly qualified in labor law or family law, or in jurisprudence. Salary on appointment to the posts will be in accordance with qualifications and experience within the ranges: Senior Research Fellow \$17,183-\$20,052 p.a.; Research Fellow \$12,063-\$16,084 p.a. (Australian currency). Tenure is normally for three years in the first instance with a possibility of extension to five years. Reasonable travel expenses are paid. Superannuation benefits are available.

Prospectives should write to the Academic Registrar for further particulars before applying. Address all correspondence to G.E. Dicker, Academic Registrar, P.O. Box 4, Canberra, ACT, 2600, Australia. Closing date is February 13, 1976.

Head, Department of Mathematics Professor of Mathematics

Lamar University, Beaumont, Texas

Duties: to provide leadership for the Department of Mathematics; to teach and perform related duties in the graduate and undergraduate mathematics programs; to provide the faculty and students with a teaching-learning-research environment; and to satisfy the need for professional growth in mathematics, computer science, and related areas within the Department.

Qualifications: PhD in Mathematics or the Mathematical Sciences preferred, unless unusual qualifications pertain; broad knowledge of basic and applied mathematics and capability of developing programs in the mathematical sciences, pure and applied mathematics, computer science, and mathematics teacher education; twelve years professional experience; proven administrative and teaching ability; record of professional accomplishments (research, publications). *Salary:* commensurate with experience and qualifications. *Location:* Lamar University, a state-supported institution on a 200-acre campus, serves southeast

Texas with the main campus located in Beaumont, Texas. Beaumont, an industrial community with a population of about 200,000, has various cultural and recreational facilities. Lamar's enrolment is about 11,000. The Department of Mathematics, within the College of Engineering, has a faculty of 26 and offers bachelor's and master's degrees. *Applications* can be obtained from Dr. George Berzsenyi, Department of Mathematics, Lamar University, P.O. Box 10047, Beaumont Texas 77710. Telephone (713) 838-8528. Deadline date is February 15, 1976.

Full, Associate, Assistant Professorship Department of History

Bishop's University, Lennoxville, Quebec

Two positions and the possibility of a third are

WE'RE LOOKING FOR VOLUNTEERS

Understanding volunteers. Volunteers who are open-minded, who are prepared to put their time to work in a different, but not so different, environment.

We're looking for volunteers for the Alberta Hospital, Edmonton. A 'mental hospital': one wholly concerned with work in the field of mental health.

We need volunteers to work in a variety of hospital programs, with a variety of people. As a volunteer, you could become part of an essential effort to help people who need a special kind of help. You may have had similar experience in the past — or you may be a student of the social or helping sciences now. But experience is not necessary, as you will be given a full orientation.

Please call Dianne Moir, volunteer co-ordinator at Alberta Hospital, Edmonton, for more information. Her number is 973-3361, ext. 257.

Transportation is arranged for volunteers at the hospital, which is just outside Edmonton's northeastern city limit.

Alberta
SOCIAL SERVICES
AND COMMUNITY HEALTH

available. An established scholar is sought for the senior position and a PhD for the junior position(s). Background in Canadian history including French Canadian, US diplomatic and social history, comparative colonial societies, modern British and medieval Europe is required. Salary scales of the University apply. Effective date of appointment is July 1, 1976. Applications are appreciated as soon as possible. Bilinguals will be preferred. Address all correspondence to Dr. Charles Wojatsek, Bishop's University, Lennoxville, Quebec.

Lecturer in Physics
University of Natal, Department of
Physics, Pietermaritzburg

Applications are invited from suitably qualified persons for appointment to the post of Lecturer in Physics. Preference will be given to applicants with experience, either experimental or theoretical, in the field of molecular physics. Departmental interests at present include electromagnetic properties of molecules, broad line NMR and physical studies of heterogeneous catalysis. The salary scale attached to the post is R6 300 x 360—R9 180 per annum. The commencing salary notch will be dependent on the qualifications and/or experience of the successful applicant. In addition, an annual vacation saving bonus is payable, subject to Treasury regulations. Application forms, further particulars of the post, and information on pension, medical aid, staff bursary, housing loan and subsidy schemes, long leave conditions and travelling expenses on first appointment are obtainable from the Registrar, University of Natal, King George V Avenue, Durban, 4001, with whom application, on the prescribed form, must be lodged not later than January 31, 1976, quoting reference ADV. 92/75.

Assistant Professor of Biology
Department of Biology
The University of Mississippi

The staff member in this position will be expected to teach undergraduate comparative anatomy and embryology and graduate courses in embryology. This department wants to develop a strong graduate

research program in embryology with many PhD students. The new member will be expected to continue a very active research program; it would be possible to have 5-10 graduate students working under the direction of this member. The new staff member will also be expected to continuously seek outside funding for the research program and for summer support, since University support of research is somewhat limited. If salary support is obtained by grants, release from teaching duties can be expected. *Qualifications:* PhD required. Post-doctoral research experience and publication preferred. Some publications in national journals required; since an active research program is expected, the applicant is expected to have firm research plans already formulated. *Applications:* Correspondence, three letters of recommendation, and official transcripts of all college records should be sent to: Dr. Iola T. McClurkin, Professor of Biology, Biology Department, University of Mississippi, University, Mississippi 38677, Telephone: (601) 232-7203. Applications should be received by March 15, 1976. The University of Mississippi is an Equal Opportunity/Affirmative Action Employer.

PERSONAL NOTICES

All advertisements must be received by 9 a.m. the Friday prior to publication. Rate is 15 cents per word for the first week, and 5 cents per word for subsequent weeks ordered before the next deadline. Minimum charge is \$1. Ads must be paid in advance. We regret that no ads can be taken over the telephone. For order forms or further information, telephone 432-4991.

Accommodation available

Thinking of selling your home? Today's real estate market fluctuates. Make sure you receive top value. Call a professional. Call Ross Lizotte, Buxton Real Estate Ltd., 436-1140, 426-5880, extension 990.

For sale—Duggan; custom-built 3-bedroom bungalow; open beam cedar ceiling; study and 4th bedroom in basement. R1DP; 2-car garage. \$75,800. Phone 432-5338, 436-2776.

Accommodation wanted

Wanted to rent—Childless, petless, married couple, faculty members, seek apartment, small house, part of house, from January or February 1st, close to campus. Phone 432-5891 or 973-6787, L. Fedigan. Working gentleman wants 1-bedroom apartment or bachelor suite near campus. 432-5025, or 439-4235 evenings. Quiet responsible couple want to rent small house; preferably near wooded area. References. 439-1516, 432-5913.

Automobiles and accessories

Motorcycles wanted. 550cc or smaller. Both dirt and street machines considered. I am paying cash for the right bike. 477-7322.

Goods and services

Professor of English selling books at bargain prices. Varied subjects. January 16 and 19, 10 a.m.-4 p.m. Humanities Centre, office number 4-33. Selling Besson trombone, \$165; Smith-Corona typewriter, \$45. 432-5773. Low fare to the Orient; departing Vancouver daily. Contact Eric Choi, 425-0554. Windsor Park Nursery School. Vacancies for 3- and 4-year old children. Advance registration accepted for September 1976. Phone 439-3040. Handyman carpentry service. Call 434-9709 after 6 p.m. Will type theses, manuscripts, etc. Experienced typist. Phone 459-5276. Peking, Shanghai food. Delicious, inexpensive. Simple surroundings. Shanghai House, 6525 111 Street. 435-7622. Typing, fast, accurate service. Phone Georgina Campbell, 489-4810 evenings. Services available—Research and documentation, proof-reading, editing, re-writing, photodocumenting, for all kinds of technical and research papers. Field and literature research and photographic documenting; library of photos; biological, some historic, ethnologic subjects, etc. For information telephone: Dr. Jim R. Salt, 439-0964. Plumbing—For estimates on basement bathrooms, repairs, gasfitting, etc. call 465-7079. English setter pups, purebred, no papers. \$25. 432-4430, 454-7872. Person who took sheepskin gloves from Faculty Club cloak room on January 6, please leave at desk. No questions asked. For sale—1970 Ford Galaxy 500, excellent condition. Sofa and chair. 19" TV, b/w, stand. 434-9785.

University of Alberta Area Transportation Study

Attention residents of Windsor Park, Garneau, McKernan, Queen Alexandra, Parkallen, Allendale, and Belgravia. The University of Alberta Area Transportation Study requires your input.

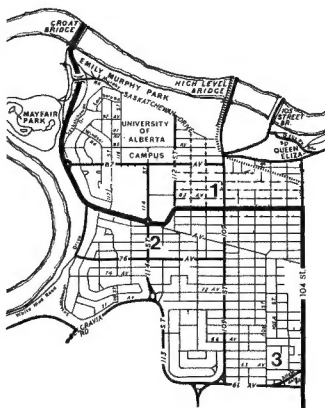
Information Exchange Centres are being held to inform the general public of the progress of the University Area Transportation Study. Drop in at any or all of the centres and let your thoughts be known.

1. Tuesday, January 20, 2-9 p.m.
Garneau Community League Hall
10943 84 Avenue

2. Wednesday, January 21, 2-9 p.m.
McKernan Community League Hall
11341 78 Avenue

3. Thursday, January 22, 2-9 p.m.
Allendale Community League Hall
63 Avenue and 105A Street

For further information call:
University Area Transportation Study
433-2295



Dr. K.C. Dean Dr. H.D. Hunter
Dr. J.L.D. Williams Dr. B.L. Trump

Optometrists

Campus Towers 11151 87 Avenue

For appointment please call
439-2083